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GE Medical Systems
Invention Disclosure Sheet

3000 North Grandview Blvd., W-710
P. O. Box 414, Waukesha WI 53188

Docket No: 11 2001

To: SUSAN DONAHUE, W-710
Patent Paralegal

Adv Applications (902) DEPARTMENT
CT Engineering SECTION

Date: [redacted]

Title: CT Dose utilization database

Background of invention

Minimizing the population dose exposure from CT examinations has become increasingly important. A method adopted by the European Union (directive 97/43) requires that institutions keep records regarding the dose they use according to diagnostic procedure and individual patient. From these records, institutions can be audited to see if they conform to dose reference guidelines. These guidelines are established by EU authorities and are based on statistical methods. Some examples are given in Tables 1, 2, and 3 of "European Guidelines on Quality Criteria for Compute Tomography" EUR 16262. Institutions are at legal risk if they are a high dose statistical outlier and exceed dose guidelines.

CT dose is becoming an issue in the US as well. Recent media articles, radiology journals, and FDA advisory committees have published material expressing concern and asking what can be done to reduce population dose exposure from CT.

Invention Description

This invention allows a network of scanners to have access to a dose database. A local database (for the institution) and a global database for all network memebers would be provided. The dose database is updated automatically after scans are executed by network members. Before a scan is prescribed the user can see how much dose is used by others in the network for a similar procedure. This could help high dose users to question their practice. In the EU the local institution database would automatically

Thomas L. Toth	[redacted]	[redacted]
(1st Inventor)		
(2nd Inventor)		
(3rd Inventor)		
Print Inventor Name/ Full Signature Above	Phone #	Date

Witnessed and Understood By Me: Kelly L Kerr (SIGNATURE) [redacted] (DATE)

Witnessed and Understood By Me: (SIGNATURE) (DATE)

[redacted]

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maintain required site records. The global database could also serve as a protocol starting point for users who are unsure of how much dose to use for a given diagnostic objective (exam type).

The user could query the database to find the mean dose, the standard deviation, and an optional histogram plot for the CTDIw, and DLP as a function of the Scanner model, Examination type (diagnostic objective) and patient demographic. Automatic submission to the database is easily possible since the scanner already computes CTDIw and DLP for display on the monitor when the scan is prescribed. This final information would simply be sent to the database servers and statistically tabulated.

As a minimum the Exam types would be: Head, Face and Sinuses, Vertebral trauma, Chest, Lung HRCT, abdomen, Liver and spleen, Pelvis, and Osseous pelvis could be included. Provisions could be made for the user network to add new examination types.

As a minimum the Demographic selections would be: All, gender, age group, and weight group specified as logical combinations. For example, the user might be interested in the dose typically used for scanning a 15 year old, female (with no restriction on height, or weight).

The user could therefore know at the point in time when they are generating a scan protocol or are prescribing a scan, how their dose utilization compares with their peers. If they should find that their protocol dose is several standard deviations higher than the database mean, it would serve as a motivation to consider a reduced dose protocol.

Thomas L. Toth	[redacted]	[redacted]
(1st Inventor)		
(2nd Inventor)		
(3rd Inventor)		
Print Inventor Name/ Full Signature Above	Phone #	Date

Witnessed and Understood By Me: Kelly L. Lorenz (SIGNATURE) [redacted] (DATE)

Witnessed and Understood By Me: _____ (SIGNATURE) [redacted] (DATE)

[redacted]

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In the future, auto exposure control (Auto mA and SmartScan) will allow the user to prescribe scan dose indirectly by a desired image noise target value. In this case the dose is adjusted to the patient to obtain the desired diagnostic quality independent of patient variability. The database could be produced for target noise instead of or in addition to dose. In this case the database tells the user how much noise is typically used by network members for a specified clinical diagnostic objective (Exam type). This tells them the diagnostic quality that others find satisfactory for a given diagnostic objective.

Thomas L. Toth	[redacted]	[redacted]
(1st Inventor)		
(2nd Inventor)		
(3rd Inventor)		
Print Inventor Name/ Full Signature Above	Phone #	Date

Witnessed and Understood By Me: Kelly L Karau (SIGNATURE) [redacted] (DATE)

Witnessed and Understood By Me: (SIGNATURE) [redacted] (DATE)